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PLANT IMMIGRANTS

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United States Department of Agriculture
BUREAU OF PLANT INDUSTRY
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION

E X P L A N A T O R Y N O T E

PLANT IMMIGRANTS is designed principally to call the attention of plant breeders and experimenters to the arrival of interesting plant material. It should not be viewed as an announcement of plants available for distribution, since most introductions have to be propagated before they can be sent to experimenters. This requires from one to three years, depending upon the nature of the plant and the quantity of live material received. As rapidly as stocks are available, the plants described in this circular will be included in the Annual List of Plant Introductions, which is sent to experimenters in late autumn. Introductions made for a special purpose (as for example to supply Department and other specialists with material needed in their experiments) are not propagated by this Office and will not appear in the Annual List.

Descriptions appearing here are revised and later published in the Inventory of Seeds and Plants Imported, -the permanent record of plant introductions made by this Office.

DAVID FAIRCHILD
*Agricultural Explorer in Charge,
Office of Foreign Seed and Plant Introduction.*

Issued February 26, 1924, Washington, D. C.

ANNONA DIVERSIFOLIA (Annonaceae), 58030. **Ilama.** From Chiapas, Mexico. Seeds presented by Dr. C. A. Purpus, Zazuapan, Huatusco, Vera Cruz. "It is now several years since the Office of Foreign Seed and Plant Introduction undertook an investigation of this little-known relative of the cherimoya, and decided that it is a species worthy of wide cultivation in the Tropics. In these few years several thousand seedlings have been distributed, not alone in America, but also in southern Asia and elsewhere. A young tree growing in the Plant Introduction Garden at Miami, Fla., came into bearing in 1923. So far as known, this is the first time ilamas have been produced in the United States. The tree has always been very limited in its distribution. It is native to southern Mexico, Guatemala, and Salvador, where it is found usually in foothill regions at elevations not greater than 2,000 feet. In some parts of Mexico it is called ilama; in Chiapas 'papauce,' and in Guatemala and Salvador 'anona blanca.'

"The climatic requirements of this tree are similar to those of the sugar-apple and the custard-apple. It will withstand light frosts, and often grows in regions where the rainfall is light. Seedling trees come into bearing when four or five years old. If propagated by budding (which should be simple), they would probably bear a year or two earlier. The species is not as robust as the cherimoya, rarely reaching more than 20 feet in height, and being of somewhat slender growth. The fruit is conical, oval, or round, and weighs from half a pound to a pound or more. The surface is rough, with the carpillary areas indicated by deeply incised lines. The color varies from pale green to magenta pink, overspread with a whitish bloom, whence the common name 'anona blanca,' or 'white anona.' In pale-green varieties the flesh is pure white; in pink kinds it is tinged with that color. The flavor is similar to that of the sugar-apple, but with more acid. The seeds are about as numerous as in the cherimoya but slightly larger than those of the latter." (Wilson Popenoe.)

ARTOCARPUS ODORATISSIMA (Moraceae), 58025. **Marang.** From Manila, Philippine Islands. Seeds presented by Adn. Hernandez, director, Bureau of Agriculture. "The marang has been brought recently to the attention of horticulturists by P. J. Wester, who considers it a fruit of unusual promise. It resembles the jack fruit and the seeded bread-fruit in appearance, but is superior in quality to either of these. The tree, which grows wild in the southern Philippine Islands and the Sulu Archipelago, is medium-sized, with large, dark-green, entire or 3-lobed leaves 18 to 24 inches long. Wester describes the fruit as roundish oblong in form, about 6 inches in length, with the surface thickly studded with soft greenish yellow spines one-third of an inch long. The rind is thick and fleshy, the flesh white, sweet, and juicy, aromatic and of pleasant flavor; it is separated into segments (about the

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size of a grape) which cling to the core, and each segment contains a whitish seed nearly one-half inch long. 'When the fruit is ripe, by passing a knife around and through the rind, with a little care the halves may be separated from the flesh, leaving this like a bunch of white grapes.' In the Philippines it ripens in August.

"The tree is strictly tropical in its requirements and probably will not succeed in regions where the temperature falls below 32° F. It likes a moist atmosphere and abundant rainfall." (Wilson Popenoe.)

AVENA STERILIS (Poaceae), 58033. Oats. From Lincoln, New Zealand. Seeds presented by Dr. F. W. Hilgendorf, biologist, Canterbury Agricultural College. "'College Algerians.' This strain, also known as 'A 86,' is characterized by high tillering power, a creeping habit, quick recovery after feeding-off, and a high yield. Under our conditions of climate and soil it has yielded about 10 bushels per acre more than commercial varieties sown under the same conditions." (New Zealand Journal of Agriculture, vol. 26, p. 147.)

CUCUMIS MELO (Cucurbitaceae), 56026. Zarda Melon. From Bareilly, United Provinces, India. Seeds presented by Rev. N. L. Rockey. "The culture of the superior kinds of melon requires considerable attention, but there is hardly a fruit that better deserves it. The kind which ranks as finest of all, called the Surdah (Zarda), is a native of Kabul, and has not, that I am aware, been cultivated with success in any part of India. The fruits are brought occasionally to the Punjab for the wealthy natives, and a friend told me that when at Mooltan an offer of six rupees which he made for a single one was refused, so highly are they prized. I have several times raised plants in my garden at Firozpur. They thrived moderately well, but bore only one or two fruits, which always rotted on the under side before beginning to ripen. From a portion of one which remained partially sound, I was enabled to discover how delicious this fruit must be when raised in perfection. The seeds of this kind are at once to be distinguished from those of any other, being fully four times larger." (Firminger's Manual of Gardening for India, ed. 5, p. 225.)

FRAGARIA CHILOENSIS (Rosaceae), 58024. Chile strawberry. From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon, in charge, Department of Botany and Forestry, Experiment Station of the Sugar Planters' Association. "These seeds were sent to Dr. Lyon from Ecuador, where they were collected by Dr. Francis X. Williams, probably in the vicinity of Ambato. Not far from this town there are large fields devoted to the cultivation of this plant, the only ones in all Ecuador. The soil is a light volcanic sand, the rainfall not over 15 or 20 inches a year, and the elevation about 9,500 feet."

"The 'frutilla,' as it is called, was not cultivated in Ecuador previous to the Conquest. Garcilaso de la Vega recounts that it was brought to the highlands of Peru from Chile in 1557, and it probably reached Ecuador at an even later date. The native home of the large-fruited sorts which are grown in these three countries is somewhere in Chile. In 1714 the species was introduced into Europe, through the efforts of M. Frezier, a Frenchman who carried plants with him from the region of Concepcion, Chile. Up to that time, large-fruited strawberries were not known in Europe. Horticulturists had contented themselves with the native wood strawberry (*F. vesca*), the Hautbois (*F. moschata* or *F. elatior*), and the Virginian strawberry (*F. virginiana*), which latter was not introduced from America until after 1600. All of these are small fruited, though of good flavor and quality. By crossing with progeny of the plants brought from Chile by M. Frezier, horticultural forms were developed which combined large size with delicate flavor, especially in those cases where *F. virginiana* entered into the combination. The varieties thus obtained were the progenitors of the cultivated sorts now grown not only in Europe, but also in North America and elsewhere.

"Plant breeders of the present day are utilizing *Fragaria chiloensis* in the production of new horticultural varieties through crossing with cultivated forms as well as wild species. The securing of many different strains of *F. chiloensis* has become, therefore, a matter of importance. Though there is a remarkable lack of apparent variation among the strawberries of Ecuador, Peru, and Chile, - only two well-defined forms being cultivated, one white fruited, the other red, - it seems reasonable to believe that slight variations do occur, and that differences in productiveness as well as fruit characteristics may have passed unobserved, due to the fact that the cultivated strawberries of South America have received little study. The Office of Foreign Seed and Plant Introduction is interested in securing, for the use of plant breeders, plants or seeds of *F. chiloensis* from as many sources as possible. (See S.P.I. No. 58024 for other information concerning this plant.)"
(Wilson Popenoe.)

GARCINIA MANGOSTANA (Clusiaceae), 58027. Mangosteen. From Paris, France. Seeds purchased from Vilmorin-Andrieux & Co. "For more than twenty years the Office of Foreign Seed and Plant Introduction has been interested in the establishment of the Asiatic mangosteen, reputed to be the 'Queen of Fruits,' in the tropical American dependencies of the United States. Dr. David Fairchild, who investigated its cultural requirements in Ceylon, Siam, Cochin China and Java, reached the conclusion that 'the acclimatization of the mangosteen on the Island of Porto Rico, and in many other parts of tropical America, is a possibility, and that the principal difficulties of its culture have probably arisen from an ignorance of the soil conditions demanded by the plant.'

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"For many years it was believed that the mangosteen could not be made to bear fruit outside the Asiatic Tropics. There is now a fruiting orchard of more than a dozen trees on the Island of Dominica in the West Indies, and another of nearly the same size near Guayaquil, Ecuador. Fruit has also been produced in Trinidad, Jamaica, and the Hawaiian Islands. It is evident, therefore, that the mangosteen can be grown successfully in many regions, given the proper conditions of climate and soil, and appropriate cultural treatment.

"The seeds of this fruit are among the most difficult in the world to transport long distances. Year after year the Department of Agriculture has received small shipments from Ceylon, Java, and other parts of the Asiatic Tropics, without being able to save more than an insignificant number of them. Attempts to secure seeds from the trees in Dominica have been somewhat more successful, but large quantities are not available from that source.

"In 1922, it was found that seeds obtained through Vilmorin-Andrieux and Co., of Paris, reached Washington in better condition than any which had been obtained previously from any source. A good number of plants was grown from this seed, but, due to their extremely slow growth, they will have to be kept in the greenhouses at Washington until they are two years old, when they will be ready to send out for testing in various parts of Latin America. In order to increase the stock available for this use, a second shipment of seeds has been secured this season." (Wilson Popenoe.)

HIBISCUS ROSA-SINENSIS (Malvaceae), 58035. Chinese hibiscus. From Manila, Philippine Islands. Cuttings presented by Adn. Hernandez, director, Bureau of Agriculture. "The Chinese hibiscus is an exceedingly popular ornamental plant in southern Florida, where the single scarlet variety is practically the only one which has been commonly planted up to this time. The Department has undertaken to introduce the best forms from other parts of the world, in the hope of diversifying somewhat the ornamental plantings of Florida gardens. The scarlet variety, though a handsome and useful plant, is in danger of becoming monotonous. An excellent collection of new varieties has recently been introduced from the Hawaiian Islands, where much has been done to improve this genus by breeding." (Wilson Popenoe.)

HYPHAENE CRINITA (Phoenicaceae), 58028. Palm. From Pretoria, Union of South Africa. Seeds presented by C. P. Lounsbury, Chief, Division of Entomology. A South African fan palm which in some sections of its native country reaches a height of 30 feet. The leaves are used by the natives to make matting, basketware, and rope. From the sap, obtained by tapping the trunk, a native beverage is prepared. (Adapted from Marloth, Flora of South Africa, vol. 4, p. 50.)

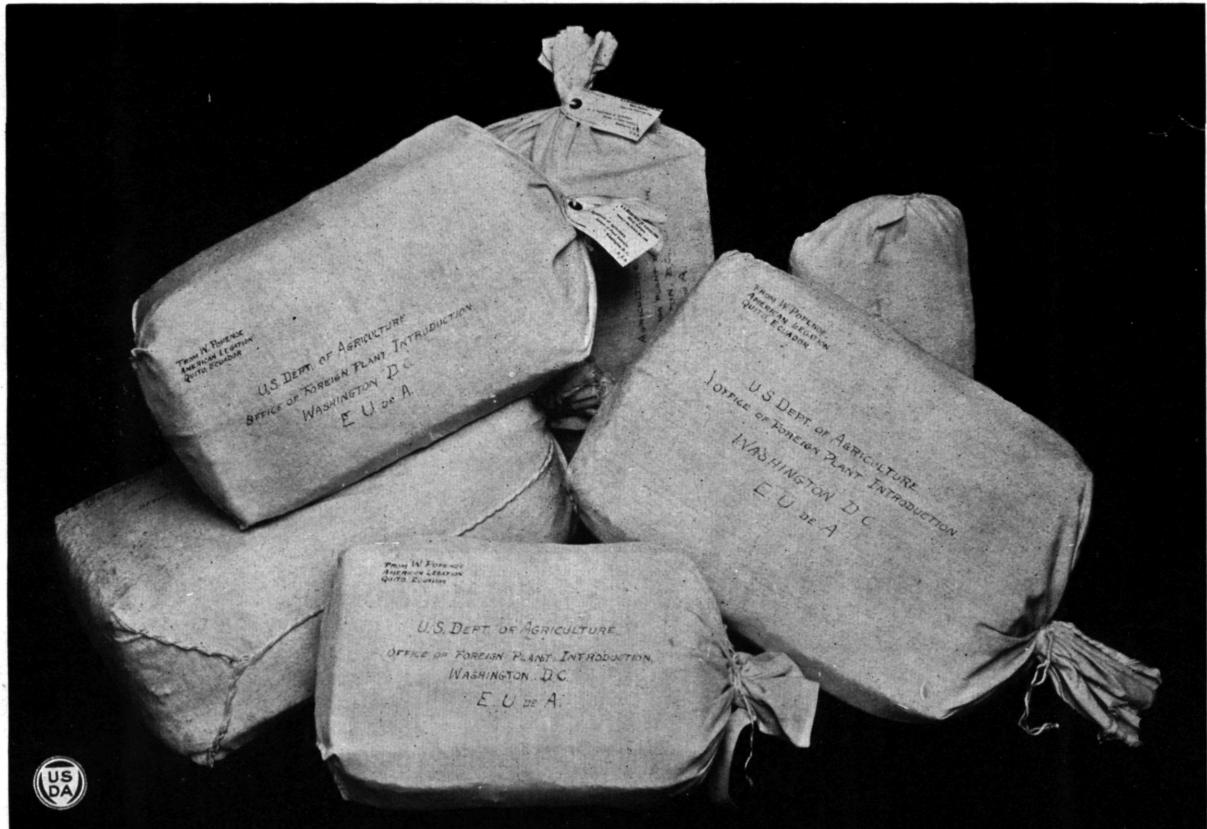


AN INTERESTING HOLLY FROM THE ANDES.

(*Ilex* sp.; S. P. I. No. 51788.)

From an elevation of 10,000 feet, near Bogota, Colombia, has come this new holly, whose behavior in the greenhouses at Washington indicates that it may prove to be an ornamental plant of unusual value. Its shapely form, even when very small, and its handsome, glossy green foliage make it a pot plant of attractive appearance. When larger it produces red berries in great abundance. It should prove hardy enough for cultivation outdoors in California and Florida, if not generally throughout the Gulf Coast region. (Photographed by Wilson Popenoe at Bogota, Colombia, October 14, 1920; P18141FS.)

Pl. 343.



PLANT IMMIGRANTS READY TO START FOR THE LAND OF THEIR ADOPTION.

The successful shipment of live plants and cuttings from distant countries to the United States forms the most difficult part of the agricultural explorer's work. Great care must be exercised in packing the plants to insure their reaching Washington without either having dried out or having decayed from too much moisture. Sphagnum moss, waxed paper, and newspaper are used in packing, and each bundle is securely sewed in a cotton jacket. The lot above shown, prepared for shipment at Ambato, Ecuador, and over a month on the road between that point and Washington, contained tubers of several new potatoes, cuttings of the babaco or hardy papaya and the capulin or Andean black cherry, as well as seeds of several Andean fruits. (Photographed by Wilson Popenoe at Ambato, Ecuador, January, 1921; P18313FS.)

GOVERNMENT PRINTING OFFICE

KENNEDIA RUBICUNDA (Fabaceae), 58036. From Richmond, Victoria. Seeds presented by F. H. Baker. A very attractive twining shrub, sometimes 5 or 6 feet in length, with dark-green, oval leaflets, 3 to 4 inches long, and numerous large, showy, dark-red flowers which occur in pairs in the leaf axils. This species is native to New South Wales. (Adapted from Sulman, Wild Flowers of New South Wales, p. 130.)

MANGIFERA INDICA (Anacardiaceae), 58031. Carabao mango. From Manila, Philippine Islands. Budwood presented by Adn. Hernandez, director, Bureau of Agriculture. "This is a well-known seedling race of the Philippines, where it is considered, in several regions, the best of all mangos. It belongs to a group whose center of distribution appears to be in southeastern Asia, perhaps Cochin China. These mangos are sufficiently distinct from the common Indian forms to have led certain botanists to consider them botanically different. *Mangifera cambodiana* is the name which has been applied to them. They are polyembryonic, hence they come true from seed, at least to a sufficient degree so that the several races reproduce themselves with a fair degree of constancy. The Cambodiana, Saigon or Chinese mango, now cultivated in Florida, varies to an extent which makes necessary the use of vegetative propagation if the best seedlings are to be perpetuated as horticultural varieties, uniform and dependable in character.

"The Carabao mango has already been introduced into Florida from the Philippines, but it seems desirable to secure as many different strains as possible, on the strength of the likelihood that some of them may prove more valuable than others. Fruit borne by the Carabao tree in the Plant Introduction Garden at Miami in the summer of 1923 was of excellent quality.

"Some people prefer the Philippine mangos to all others, while some think the Indian varieties superior. The latter are richer, but the best Philippine sorts, such as Carabao, have a peculiarly refreshing taste which is highly agreeable.

"Mr. Wester says of Carabao in the Philippines: 'The tree is of vigorous growth with fruit mostly ripening from the latter part of May through June and the early part of July; by smoking the tree (the physiological effect of which is not quite understood) and by chopping the bark of the trunk the Filipinos force the trees to bear fruit early in March, but this fruit is not so well flavored as that produced later. A few mangos are found in the market nearly all the year.'

"Carabao, like the other mangos of its group, is long and slender in form, pointed at the apex and distinctly flattened longitudinally. It is not as bright-colored as some of the Indian sorts, the surface being clear golden yellow in the mature fruit, but it is usually free from anthracnose stains, which is rarely true of the best Indian varieties.

It has little of the strongly aromatic fragrance which characterizes such sorts as Amini and Mulgoba, but its flavor is spicy, subacid, and very pleasant. The fiber is confined mainly to the ventral edge of the seed, and is not troublesome when the fruit is eaten. A favorite way of serving the Philippine mangos in tropical America (they have long been grown in Cuba and the State of Vera Cruz, Mexico, where the Spaniards probably introduced them direct from Manila) is to peel them, insert a fork in the basal end of each fruit, and place them in a bowl of cracked ice, the fork handles only protruding.

"Mr. Wester gives the following technical description of the Carabao mango: 'Average weight 230 grams; form oblong, asymmetrical, with full cheeks; ventral shoulder usually prominent; dorsal shoulder short; stem inserted squarely or obliquely; base rounded; beak rather indistinct and variable, sometimes coinciding with apex; nak about 15 to 25 mm. above apex, usually not prominent; surface smooth; color yellowish tinged with green; lenticels light yellow, usually sparse at basal end of fruit, abundant on apical portion; skin medium thin, tough; flesh yellowish, paler than the 'Pico,' very tender and melting; flavor very delicate, aromatic and spicy; fiber medium coarse, short, confined almost entirely to edges of seed; seed oblong, medium large; polyembryonic.'"

NICOTIANA TABACUM (Solanaceae), 58029. Tobacco. From Teheran, Persia. Seeds presented through Bernard Gotlieb, American consul. "Seeds of the finest grade of the Persian tobacco variety known as 'Shiraz Tumbac.'" (Gotlieb.)

STRYCHNOS SUBEROSA (Loganiaceae), 58032. From Kisantu, Belgian Congo. Seeds presented by Frere J. Gillet. "The fruit of this species is edible." (Gillet.)

A spiny shrub or small tree, with oval, leathery, dull-green leaves. It is very similar to *Strychnos gilletii* (S.P.I. No. 58020). (Adapted from Annales du Musee du Congo, ser. 5, vol. 1, p. 177.)

Notes on the Behavior of Previous Introductions.

AMYGDALUS PERSICA NECTARINA (Amygdalaceae), 34684. Quetta nectarine. (Budded on common peach stock.) From Quetta, Baluchistan, India. "I have been testing out the Quetta nectarine in a very exposed place for the past six years, and, although I do not get a crop every year, I find it just as hardy as any of my peaches. This year we had a very large crop, a large part of which we canned." (W. C. Degelman, Pittsburgh, Pa., December 27, 1923.)

CAPSICUM ANNUUM (Solanaceae), 38788. Red pepper. From Feicheng, Shantung, China. "This pepper was sown in March, and by June tenth

began to set fruit. Late in August the fruits were ripe. The latter are long, bright red and smooth, very numerous, and quite pungent. They are excellent for any purpose where peppers are used." (C. S. Fouse, Mount Union, Pa., January 1, 1924.)

CHAMAEDOREA ELEGANS (Phoenicaceae), 49373. **Pacayito.** From Tucuru, Alta Verapaz, Guatemala. "This is the finest house palm I have ever seen. As long as it has plenty of water and rich soil it asks nothing more, and does better indoors than out. My plant is now 26 inches tall, with eleven leaves and two flower spikes." (Mrs. W. D. Diddell, Woodbine, Ga., January 4, 1924.)

CHAYOTA EDULIS (Cucurbitaceae). **Chayote.** "A man who has a place on the muck soil of the Everglades has sold me about fifteen dollars' worth of chayotes, all from one vine which is still producing. Chayotes do well on that soil and the quality is good. They keep so well that I am sure they will ultimately become a staple shipping crop; I do not find that they rot easily." (Charles I. Brooks, Miami, Fla., January 5, 1924.)

CUCURBITA MOSCHATA (Cucurbitaceae), 56025. **Cushaw.** From Libia, Africa. "When steamed with a cream sauce, or fried like egg plant, the flesh has a very agreeable, mild flavor and is a welcome addition to our list of vegetables." (B. S. Blake, Weston, Mass., October 29, 1923.)

DURANTA TRIACANTHA (Verbenaceae), 52575. **Chivo.** From Ambato, Ecuador. "This is exceptionally fine, and, with a little training, is making a beautiful round head." (Mrs. W. D. Diddell, Woodbine, Ga., January 4, 1924.)

JUGLANS REGIA (Juglandaceae), 40394. **Walnut.** From Acireale, Sicily, Italy. "The 'Sorrento' is a pretty nut and is very favorably considered by the California Experiment Station at Riverside, where it has done very well under unfavorable circumstances." (Claude D. Tribble, Elk Grove, Calif., December 11, 1923.)

MORINGA OLEIFERA (Moringaceae), 46386. **Horse-radish tree.** From Managua, Nicaragua. "When this tree is in bloom it reminds me very much of the locust in the size, color, and odor of the flowers. At all times the long, slender, light-colored trunk and beautiful leaves make this a very desirable ornamental. Its quick growth from seed, 30 feet in one year, make it well worth planting in this section. The roots have the same odor as horse-radish, but are slightly milder in taste, and may be used as a substitute for the latter." (J. A. Close, Gatun, Canal Zone, January 3, 1924.)

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PRUNUS SPINOSA X DOMESTICA (Amygdalaceae), 32673. Plum. From Kozlov, Russia. "This has withstood our rigorous winters without any damage; it is a moderately fast grower, of good form, and bears fruits which ripen in early September. These are nearly white, of good size and most delicious in flavor, sweet and juicy." (W. A. Dana, Eau Claire, Wis., December 27, 1923.)

STILLINGIA SEBIFERA (Euphorbiaceae), 47363. Tallow tree. From Peking, China. "Too much can not be said for this beautifully symmetrical tree. The foliage is very ornamental, the tree grows rapidly, and is freer from insect pests than any other deciduous tree I know of." (Mrs. W. D. Diddell, Woodbine, Ga., January 4, 1924.)

FOREIGN SEED AND PLANT INTRODUCTION

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